

### **REMARKS/ARGUMENTS**

Favorable reconsideration by the Examiner is respectfully solicited in light of the foregoing amendments and remarks which follow.

**1. Rejection of claims 2, 6, 8-15, 17 and 18 under 35 USC 112, first paragraph**

These claims have been rejected under the written description requirement of 35 USC 112. The Examiner asserts that there is no disclosure of the 45 second application of pressure. He indicates that there is disclosure that step 30 lasts 10-15 seconds and that step 32 lasts 20 to 30 seconds which adds to a total of 30 to 45 seconds, but that the pressure of 100 to 150 bars is not applied during step 30 and thus the pressure is not applied to the full 30 to 45 seconds.

Applicant respectfully points out that:

- Step 30 is a step for packing the mixture into the mold (page 10, lines 4-5 of the disclosure). This step consists of compressing the mixture in the mold, for example by lowering the upper plate 14 of the mold to a predetermined depth substantially corresponding to the desired depth of the building element to be manufactured. In other words, step 30 is a compression step, during which a pressure is applied to the mixture in the mold.
- Step 32 is also a compression step, during which the pressure applied to the mixture in the mold is higher than the pressure in step 30. The pressure applied to the mixture in the mold is increased to a threshold value beyond which the plaster is dissolved in the water (step 32) (see page 16, lines 15 to 25 of the disclosure).
- The mixture is compressed in the mold during the steps 30 and 32, for 30 to 45 seconds.

To better distinguish the invention from the prior art, Applicant has amended claim 18 to specify “compressing the mixture in the mold by first applying a packing pressure and then applying a higher pressure to the mixture to obtain the building element”. It is clear from the written description that this step of compressing the mixture occurs during a period of 30 to 45 seconds. Thus, amended claim 18 now fully complies with the written description and the Examiner’s objection raised in paragraph 2 of the Office Action is now overcome.

**2. Rejection of claims 18, 2 and 8 under 35 USC 103(a) over Revord**

The Examiner has rejected claim 18 over Revord, contending that the method of Revord consists in pressing the mixture to uniformly diffuse water throughout the calcined gypsum, the dispersion of water being not instantaneous so that one practicing the method would have pressed the mixture until the water was diffused throughout the mixture and that the pressing time is a result-effective variable that can be optimized through routine experimentation. The Examiner has concluded from the above that a compression time of 30 to 45 seconds is an obvious feature and is not patentable.

However, this conclusion is erroneous. Applicant respectfully points out that:

- Revord does not disclose any compression time.
- Even if the water diffusion duration could be determined by routine experimentation, though this experimentation is not disclosed by Revord or by other prior documents, this duration is not of 30 to 45 seconds.
  - Brouard (US 5,507,996) indicates that this duration is 5 to 10 seconds (see col. 5, lines 57-67 and col. 6, lines 11-17) plus "several seconds" for the second stage (col. 6, lines 2-3). This means that the compression of the mixture for diffusing water throughout the mixture has a total duration of 10 to 15 seconds approximately. (Brouard indicates about 15 seconds in col. 7, lines 45-47).
  - This is confirmed by the present application which indicates that packing step 30 lasts 10 to 15 seconds.
  - The difference between this 10-15 second duration for diffusing water in the mixture and the duration of 30 to 45 seconds recited in claim 18 corresponds to the duration of step 32 in the present application, which is a step during which the plaster crystallization is inhibited in the mold by a combination of the high pressure applied to the mixture and of the large quantity of water contained in the mixture.
  - Revord does not disclose a step of compressing the mixture by first applying a packing pressure and then applying a higher pressure. Nor does Revord disclose compressing at a higher pressure wherein the pressure and quantity of water are sufficiently high to prevent

crystallization. Revord also does not indicate the duration of his compression, and thus neither teaches nor suggests the claimed duration of 30 to 45 seconds.

- Revord teaches the application of pressure to a mixture in a mold when the mixture contains 20% water or less. Under these conditions, crystallization is not prevented, even when the pressure applied to the mixture in the mold is very high.

Since the combination of steps recited in claim 18 is neither disclosed nor suggested in the Revord patent, claim 18 as now presented is patentable over Revord.

The Examiner has also rejected claim 2 over Revord which teaches the conventionality of using 40 to 70 cc water for 100 parts by weight of plaster (col. 1, lines 64-69). However, this quantity of water is used in a slurry process, when the water is merely poured into the mass of plaster (col. 1, line 52-53), and is not used when the mixture of plaster and water is molded under pressure. In the latter case, Revord teaches that 16 to 20 cc of water are used for 100 parts by weight of plaster. As claim 2 relates to a process wherein the mixture of plaster and water is molded under pressure and not to a slurry process, claim 2 is patentable over Revord.

**3. Rejection of claims 18, 2, 6, 8, 12, 17 under 35 USC 103(a) over Brouard in view of Randel and Revord**

According to the Examiner's assertion, Brouard is silent with respect to:

- a) the amount of pressure applied to the mixture and to the quantity of water to prevent plaster crystallization under pressure in the mold;
- b) the pressure applied to the mixture in the mold for 30 to 45 seconds;
- c) the plaster crystallization outside the mold.

However, the Examiner contends that these features are obvious, since:

- a) The pressure of 100 kg/cm<sup>2</sup> disclosed by Brouard is sufficiently high to produce the claimed effect.
- b) Brouard teaches two compression stages substantially the same as disclosed in the application.
- c) Brouard teaches that only 70% of the plaster hydration occurs in the mold, so that from 70% to 100% of the plaster crystallization occurs outside the mold.

This may be true, but the problem which is:

- a) raised by the present invention,
- b) not solved by Brouard, and
- c) not obvious over the prior art,

is to prevent the 70% plaster crystallization in the mold. Clearly, this is not addressed by Brouard.

The object of Brouard is to obtain an "opposed expansion" of the plaster in the mold during 1.5 minutes to 5 minutes (col. 7, lines 32-35) which corresponds to about 70% - 90% of the complete plaster crystallization (col. 6, lines 43-47). The means disclosed by Brouard permit a major part (70% - 90%) of the plaster crystallization to occur under pressure in the mold.

Brouard teaches:

- a) to compress the mixture in the mold in two stages ;
- b) then to leave the mixture during 1.5 to 5 minutes in the closed mold in order to obtain an opposed expansion of the plaster under pressure in the mold and to obtain 70% to 90% of the plaster crystallization in the mold;
- c) then to open the mold and to unmold the building element.

But Brouard neither discloses nor suggests that his step b) could be eliminated and he does not disclose that the plaster crystallization should be prevented in step a).

Thus, the combination of steps defined in claim 18 is neither taught nor suggested by Brouard.

Additionally, Randel and Revord neither disclose nor suggest that step b) above could be eliminated in a process for making a building element from a mixture of plaster and water, and they do not teach the combination of steps recited in claim 18.

Randel teaches (page 4, lines 2-19) that a pure crystalline calcium sulphate semi-hydrate (page 3, lines 120-121) can be mixed with 35 cc of water and that the final product has (after crystallization) a water absorption of 13.5% (when mixed at atmospheric pressure). When molded by a press at 5 psi, the product has a water absorption of 5.5% and when molded at 4000 psi, the product has a water absorption of 3.2%.

It is supposed that this water absorption is measured after the final products have been dried (see page 3, lines 127-128 = dried casts having a water absorption of 35-40%).

Randel does not teach the duration of the molding under pressure and it does not teach that a particular combination of molding pressure and of water consistency could inhibit the plaster crystallization under pressure.

Randel only teaches that the water absorption of the final product can be improved when the product is molded at a pressure of 5 psi and that the benefit is negligible when it is molded at a pressure of 4000 psi. This teaching cannot suggest to cancel step b) above in the Brouard process and to compress a mixture of plaster and water for 30 seconds to 45 seconds. This duration cannot be deduced from Randel.

Revord disclosed means which do not permit inhibiting the plaster crystallization under pressure in a mold. When the mixture contains only 16 to 20 cc of water, it is not possible to inhibit the plaster crystallization in the mixture in a mold, even if the pressure in the mold is of about 150 bars or more. Moreover, Revord is silent with respect to the duration of the mixture compression and to an inhibition of the plaster crystallization when the mixture is compressed in the mold.

The Examiner also indicates that Applicant's specification does not assert any unexpected results to be attributed to the differences between the claimed method and the methods disclosed by Brouard, Randel and Revord. However, a showing of unexpected results is germane only for purposes of refuting a *prime facie* case of obviousness. In the present instance, the Examiner has failed to establish *prime facie* obviousness. Lacking is any suggestion or motivation in the references themselves for modifying the reference teachings in the manner proposed. Furthermore, the teachings, if combined, do not arrive at the claimed invention. As noted above, there is no teaching or suggestion to eliminate step b) noted above in Brouard.

Applicant respectfully points out that the method of claim 18 has a very surprising and unexpected result, which is that the plaster crystallization is inhibited in the mixture under pressure in the mold. Such a result is not disclosed in the cited prior documents and was not known in the art. Until the present invention, it was commonly admitted in the art that the

plaster crystallization begins as soon as the plaster is in contact with water and cannot be stopped.

Applicant is the first one to have found that this crystallization can be inhibited by a particular combination of pressure, of water content and of compression duration.

In Brouard, Randel and Revord, the crystallization begins when the plaster is mixed with water, it continues when the mixture is placed into a mold and is compressed in the mold, and it terminates after the product has been unmolded.

The fact that the crystallization terminates after unmolding does not mean that the crystallization was inhibited under pressure in the mold. Brouard indicates that the crystallization mainly occurs under pressure in the mold and terminates after unmolding.

Another unexpected and surprising result of the present invention is that the building elements have very good mechanical properties in terms of compression strength, density, hardness, resistance to damp and frost (i.e. small re-absorption of water), these properties being as good as or even better than those of building elements made according to the opposed expansion method disclosed by Brouard.

This result is unexpected and surprising because, in the method according to the invention, plaster crystallization occurs after unmolding, i.e. at atmospheric pressure.

In such conditions, one could expect that the final products have a relatively small density and a relatively high water re-absorption, as this is indicated by Randel (page 4, lines 2-19) which compares the water absorptions for products made at atmospheric pressure, molded at 5 psi and molded at 4000 psi. The very good mechanical properties of the building elements according to the invention are therefore an unexpected and surprising result.

It results from the above that claim 18 is new and unobvious over the prior art and produces unexpected and surprising results. Claim 18 is therefore allowable. Claims 2, 6, 8 to 15, 17 depend on claim 18 and are allowable therewith.

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It is not believed that extensions of time or fees for net addition of claims are required, beyond those that may otherwise be provided for in documents accompanying this paper. However, in the event that additional extensions of time are necessary to allow consideration of this paper, such extensions are hereby petitioned under 37 CFR § 1.136(a), and any fee required therefor (including fees for net addition of claims) is hereby authorized to be charged to Deposit Account No. 16-0605.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Raymond O. Linker, Jr.', written over a horizontal line.

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